APRIL 1932

UNIVERSAL DUO-LUXE UNITS

Syncretized Air

★ *Syncretize* -
to blend, combine
or reconcile
inharmonious elements

Syncretized Air

Syncretized Air

the greatest advance in unit heating and ventilating;

achieved by the new UNIVERSAL

DUO-LUXE *Heating and Ventilating* UNIT

JOHN J. NESBITT, INC.

Executive Office and Factory, HOLMESBURG, PHILADELPHIA, PA.

11 PARK PLACE, NEW YORK CITY

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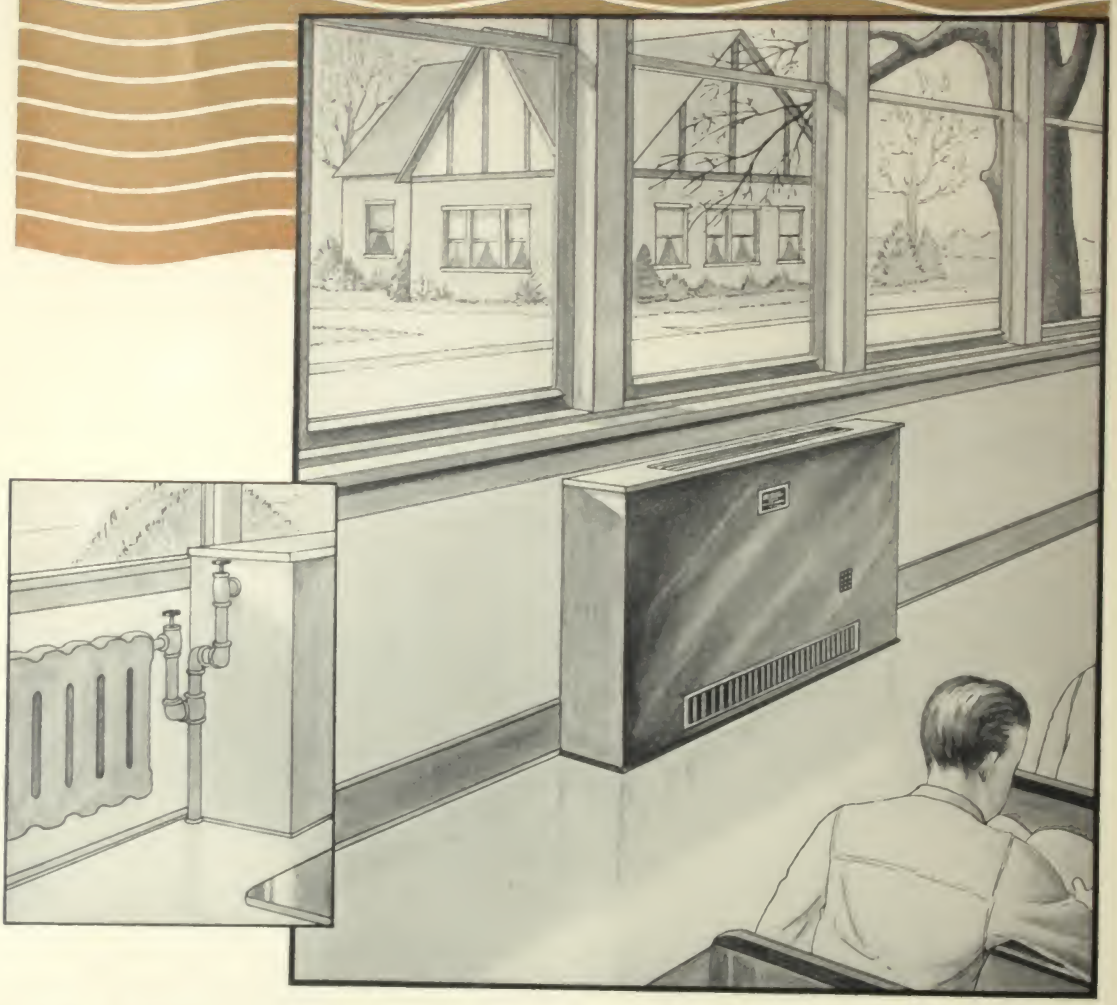


DUO-LUXE

DOUBLE DUTY—*Two radiators instead of one; capable of heating the ordinary classroom without the aid of direct radiation; substantial savings thus effected.*

DE LUXE—*All connections and controls concealed within the handsome casing; unsightly direct radiators and fittings eliminated; fits under window sill, and requires only 8-inch aisle space.*

"What is so rare as a day in June?"

June weather for children in the classroom has always been the ideal set for heating and ventilating systems. It has now been attained through creation of the Universal Duo-Luxe Heating and Ventilating Unit, which fills the room evenly with June air by syncretizing, reconciling, room temperature and air-stream temperature.

The old-fashioned duct system of heating and ventilating allowed classroom weather to fluctuate rapidly from the temperatures of chilly March to those of torrid August. It caused both cold drafts and overheating. This old system, with its low-velocity horizontal discharge, was largely supplanted by the unit ventilator, with its high-velocity vertical discharge. And that was a long step in the right direction, for the high-velocity vertical discharge provided the air motion so essential to proper ventilation.

But even these vertical discharge units were susceptible to improvement; for there was a distinct lag between the action of the

unit and the action of the thermostat control across the room. The thermostat would call for warmer air; the unit would deliver it. But before the heated air could reach the thermostat to affect it, more warm air than was actually required was usually delivered. The control was too far away from the unit; and was operated by room temperature alone, with too little regard for the temperature of the air delivered by the unit. The temperature at the thermostat might remain reasonably constant, but variations of several degrees above or below it were not unusual at other points in the room. In short, this type of control failed to syncretize air-stream and room temperatures.

For graphic proof of the conditions that exist when room-control alone is used, look at Chart 1 on Page 5. The red line indicates the wide variation in air-stream temperature. Where high, it means overheating; where low, it means cold drafts. It means, further, that the air, being of different temperatures and therefore of different densities, cannot be properly mixed. And finally, it means that constant change in the work required of the unit, causes uneconomical use of fuel.

Look now at Chart 2, which represents the performance of a Universal Duo-Luxe Unit creating syncretized air, without the aid of extra direct radiation. You will note that very soon after the unit begins to operate, the room temperature and the air-stream temperature reach a relationship that remains constant throughout the day. The stream of air that enters to maintain perpetual June, mixes readily with air at almost the same temperature. There is proper air motion without cold drafts. Moreover, tests show that

"Room Control" Results compared to "Syncretized" Results

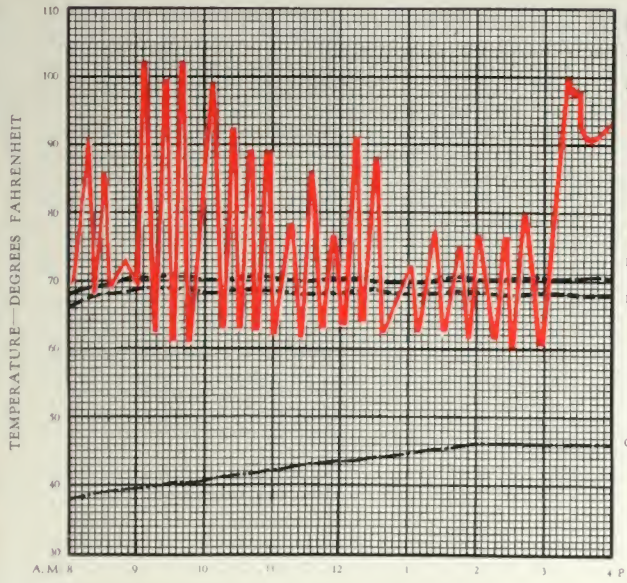


Chart No. 1
Typical "Room Control" Results

Air-Stream Temperature

Typical results by former methods, with control of room temperature alone, as recorded by an actual test. Note the unruly air-stream temperature and the varying room temperatures at different levels.

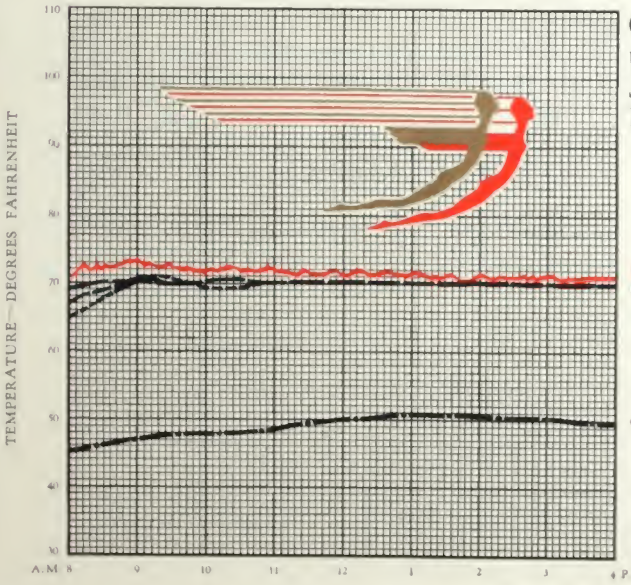


Chart No. 2
Universal *Syncretized Air* Results

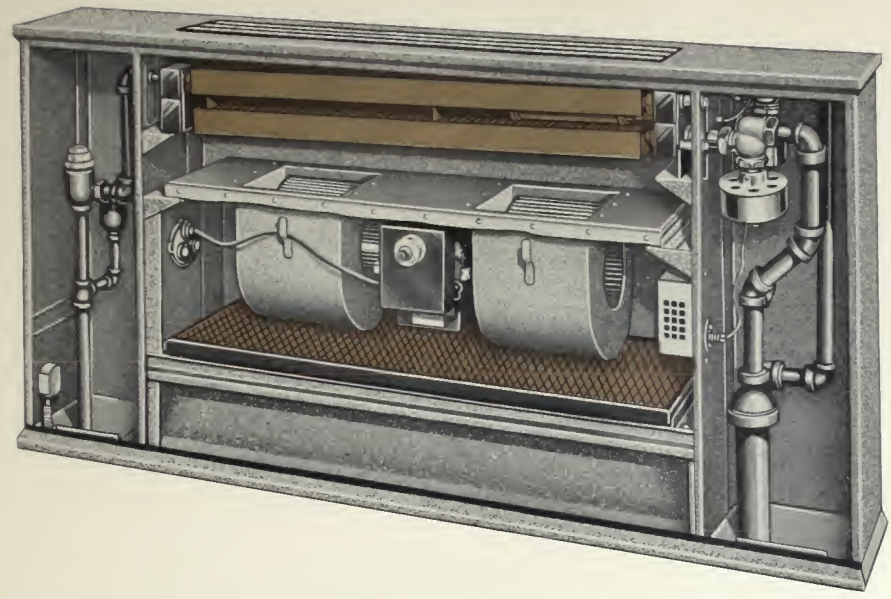
Typical results with air-stream and room temperatures syncretized by the Duo-Luxe; from an actual recording in the same room. Room temperatures at various levels are uniform; cold drafts and overheating cannot exist.

the desired temperature is maintained from the floor to the top of the occupied area. This is the ideal condition.

How is all this made possible?—First, the Duo-Luxe Unit contains two radiators and two controls. The lower radiator control is set to deliver no air below a determined minimum temperature, say five degrees below ideal room temperature. The upper radiator control is set to make this air just warm enough to maintain the ideal room temperature. This control constantly tests the room temperature by sampling air drawn in by mechanical suction. Thus the room temperature and the air-stream temperature are syncretized, brought close together, and kept there. Thus, also, air motion is provided without drafts or overheating.

The performance of the Duo-Luxe Unit is based on painstaking scientific study. Our Research Department has established the limits of variation from room temperature at which air may be admitted without causing cold drafts or overheating, and the units have been designed to operate within those limits. Also, Duo-Luxe Units are made in a range of capacities which enables us to install them with scientific accuracy, taking into account all such factors as the size and exposure of the room, and the number of persons who will occupy it.

Finally, the Duo-Luxe Unit is a thing of beauty, a delight to the architect's eye. All of its working parts are enclosed, and it occupies a minimum of aisle space. In addition to its utility as the creator of healthful syncretized air, it is pleasant to look at in any schoolroom.



Self-contained Automatic Control System

THERE is a definite unity of opinion on the importance of temperature control in ventilated rooms; but if satisfactory results are to be produced, the responsibility for this control must not be left to any individual. In schoolroom ventilation where the duty of controlling room temperature is assigned to the teacher, he or she is given a task that can be performed with far greater accuracy and satisfaction by simple automatic means, costing but a few cents a day.

Automatic control of both air-stream and room temperatures should be a part of every unit installation. Simple, inexpensive means are now available. The above photograph pictures a self-contained system for the automatic control of air-stream and room temperatures.

UNIVERSAL Copper Radiators

To produce the syncretized results as shown by Chart 2 on Page 5, requires the Universal Duo-Luxe Unit with *two radiators*. The lower radiator is the tempering radiator, and heats all air passing over it to a definite minimum temperature. The upper radiator supplies the additional heat necessary to maintain the desired room temperature.

The Lower Radiator

The more closely the minimum temperature of the lower radiator can be set to the desired room temperature the better. This adjustment will depend largely on the room's exposure to the heat of the sun. In general practice it has been found that the control stat of units in rooms located on the south side of a building should be set for a minimum temperature of 10 degrees below the desired room temperature; while in rooms not so favorably located toward the sun, the stats can be set at 5

degrees below the desired room temperature. It is a comparatively simple matter to establish this minimum temperature at which air should be introduced into the room, and to adjust and permanently set the control accordingly.

The desirable location of the stat controlling the flow of steam to the lower radiator is between the two radiators. The stat is connected by a metal tube to the steam-supply valve of the lower radiator. This stat contains a volatile substance, sensitive to changes of temperature. When the temperature of air passing through the lower radiator reaches the degree at which the lower stat is set, this stat will have closed the valve supplying steam to the lower radiator, so that only the amount of steam required to maintain the minimum air-stream temperature will be permitted to flow into the lower radiator.

In order that even the smallest quantity of steam may be evenly distributed over the full length of the radiator, brass steam-distributing tubes are provided *inside* the four tubes of the lower radiator. These smaller tubes, with steam outlets at proper intervals, effect a uniformity of temperature over the entire radiator. The air passing through the return end is equal in temperature to the air passing through the feed end.

Showing a section of the Universal copper radiators, with minimum-temperature stat between the upper and lower radiators, and steam-distributing tubes projecting from the outer tubes of the lower radiator. These internal steam-distributing tubes are also within the tubes of the upper radiator, and help greatly to produce Universal Syncretized Air.

The Upper Radiator

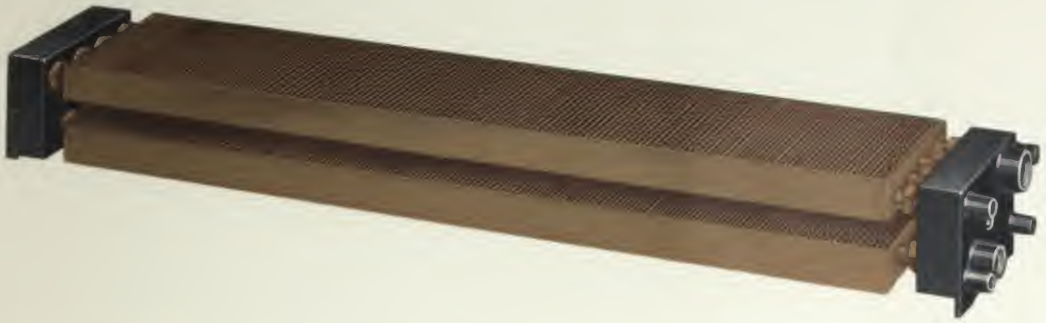
The upper radiator is the heating radiator, and has sufficient capacity to raise the temperature of the air from the minimum temperature controlled by the lower radiator to the final temperature shown in the Tables of Capacities on pages 19 to 21. The upper radiator is also provided with steam-distributing tubes.

The flow of steam to the upper radiator is regulated by the room temperature. The stat controlling the upper valve is located in a small duct connected to the suction chamber of the unit on one end, and open to room air on the other. Room air is constantly being mechanically drawn over this stat. As the room temperature increases, the volatile substance in the stat expands, closing the valve and reducing the flow of steam to the upper radiator, allowing just enough steam to enter to maintain the desired room temperature.

By this dual system of immediate-acting controls, the air-stream temperature and the room

temperature are perfectly syncretized. Wide variations in air-stream temperature are eliminated; a healthful, comfortable zone of refreshing air is maintained.

Cold drafts are impossible with the Universal Duo-Luxe Unit, because air cannot be supplied to the room at lower than 60 or 65 degrees. The air-stream control stat assures that definite minimum temperature.



The above illustration shows the complete Universal Double Radiator. Although connected to a single feed-header, two separate feed supplies are required, a definite division being provided between the steam flow to the upper and lower radiators.

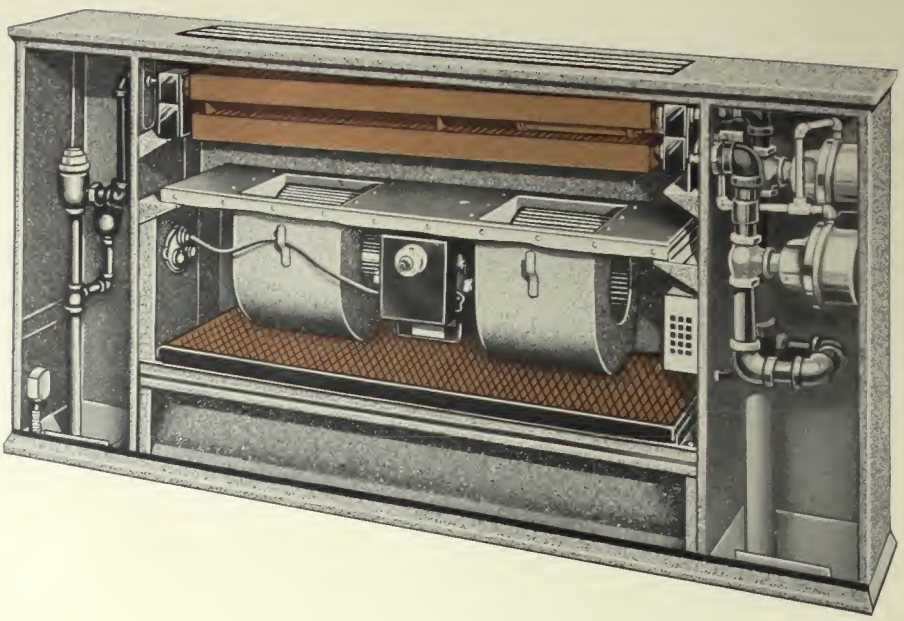
Two return connections are required for each unit. The return-headers, unlike the feed-headers, are cast independently, to provide freedom for expansion and contraction.

The steam-distributing tubes and the control valves in combination with them, are all designed to operate on return trap systems, with an individual return trap on each of the two radiators.

For best results there should not be any pressure on the returns to which these radiators are connected.

While it is desirable to maintain fairly constant steam pressures, it is not essential. All capacities mentioned on pages 19 to 21 are based upon steam at two pounds pressure at the unit; but lower pressures can frequently be carried.

A pressure-reducing valve should be used to maintain a constant pressure where wide variations in steam pressure are likely to occur.



Pneumatic Control System

THE above photograph shows the application of pneumatic systems of temperature control to the Universal Duo-Luxe Unit. The stat which syncretizes the air-stream and room temperatures may, in a pneumatic system, be located either above the radiators or between the radiators. A leak stat is generally used for this purpose, and the system functions as follows:— Before the room temperature reaches the desired degree, both valves are fully open to steam supply. On a rising room temperature the room stat (within the unit) causes air to pass through the common air line connected to both valves. This same line is also connected to any direct radiators which may be in the room.

The spring in the direct radiator or radiators, and that in the valve controlling the upper radiator of the unit, are four-pound springs. When the air pressure from the room stat reaches four pounds these valves are closed. The spring in the lower valve is an eleven-pound spring, so that when the upper valve is closed, the lower valve is two-thirds open.

If after the upper radiator closes, there is a further rise in room temperature, then the lower valve continues to close until it is entirely closed. At this point no steam can enter either radiator. The leak stat is connected to the line from the two valves, so that as soon as the two valves have completely closed off, causing air to flow over the air-stream stat at a temperature lower than 60 or 65 degrees, depending upon the minimum established, the leak stat permits a small quantity of air to leak out of the two valves. An orifice between the upper and lower valve causes the air to leak out of the lower valve at a faster rate than from the upper valve. This results in the opening of only the lower valve.

A small quantity of steam is equally distributed through the steam-distributing tubes over the entire area of the lower radiator. The control of room temperature, in effect, then becomes a function of the leak stat. The lower the outside temperature coming in contact with the stat, the more steam is admitted to the lower radiator, thus syncretizing air-stream and room temperatures, and eliminating the lag characteristic of room control alone.

Duo-Luxe Units Eliminate Direct Radiation

The Universal Duo-Luxe Unit, with its double radiator, is capable of heating and ventilating the ordinary classroom without the aid of direct radiation. Direct radiation need not be used in any room where the total B.T.U. required for both heating and ventilating is within the B.T.U. capacity of the Duo-Luxe Unit. It is, however, considered good engineering practice to provide direct radiation in corner rooms having two exposures, even though the total B.T.U. required is within the capacity of the unit selected. The results shown in Chart 2 on Page 5 were produced without direct radiation.

Since the Duo-Luxe Unit will produce superior results without the aid of direct radiation, the elimination of that factor effects a substantial saving in the cost of installation. This saving is generally more than sufficient to pay for the automatic control equipment so essential for good results.

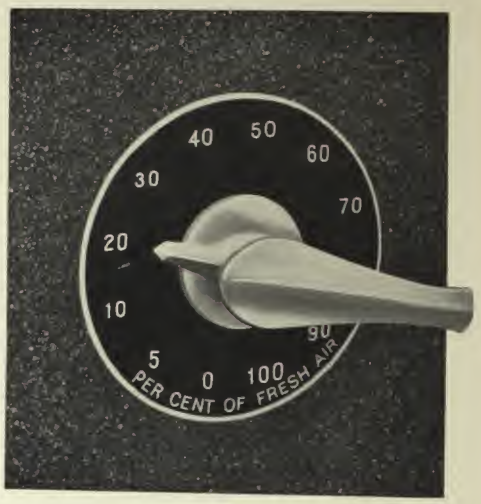
The elimination of direct radiators also simplifies the control problem, and does away with the unsightly direct radiator and its exposed piping, traps and valves. When given credit for making the direct radiator unnecessary, the Universal Duo-Luxe, double-duty, double-radiator unit, with complete automatic control, is less expensive to install than the ordinary unit system with direct radiator and without control. The automatic control feature will, in addition to producing greater comfort, effect substantial savings in fuel.

Types of Damper Control

THE inlet and recirculating damper of the Universal Duo-Luxe Unit may be electrically controlled. When so controlled, the damper is generally operated by a small heat motor. This motor consists of an all-metal, seamless bellows loaded with a volatile substance, and actuated by an electrical heat element. The element may be connected in series with the fan motor, so that the damper opens to outside air when the motor starts, and closes when it stops. It may be used in conjunction with an electric thermostat set to open the damper to outside air when room air reaches a predetermined temperature. The electric thermostat is located in the duct in which the self-contained stat of the lower radiator is located. Thus room air is constantly being mechanically drawn over the electric stat.

The small amount of current required is supplied by the same circuit supplying current to the fan motor. A small transformer must be used in each unit to reduce the line voltage to 20 volts, for which the heat motor is constructed. If at any time the electric current should fail, or when the fan motor is stopped, the intake damper closes and remains locked until the motor is again started.

Where pneumatic control is used, the damper may be controlled from a remote point through a pneumatic damper motor, air piping and compressed air. The inlet and recirculating damper can also be pneumatically controlled by a thermostat located in the same position as indicated for the electric thermostat. With proper control equipment the complete control and operation of the Universal Duo-Luxe Unit is entirely automatic.



Partial Recirculation

THE amount of air to be taken from outdoors during the period of occupancy may be varied to meet the particular requirements. In many cases substantial operating economies can be effected, without disagreeable results, by partial recirculation.

All Universal Duo-Luxe Units can be equipped with partial-recirculating equipment. A steel wall is provided between the inlet and recirculating damper to prevent outside air from passing through the recirculating grille into the room.

The volume of outdoor air is regulated by an operating mechanism with index control, as pictured above. Unless otherwise specified this control lever is enclosed within the unit casing to prevent unauthorized persons from changing the adjustment.

In all partial-recirculating installations air filters should be specified as part of the unit ventilator equipment.

The Beauty of the Duo-Luxe

THE component parts of the Universal Unit, as well as all connections thereto, are completely enclosed within a substantial steel cabinet that requires only 8 inches of aisle space. Because the unit is only 32 inches high, it can be conveniently installed under the average schoolhouse window sill.

This new Universal Unit truly deserves the name "Duo-Luxe," for it combines the two functions of heating and ventilating within a beautiful casing, enclosing all traps, valves, controls and piping connections thereto. All exposed parts, both inside and out, are finished in baked enamel.

Leadership

The Universal Duo-Luxe Unit incorporates the high-velocity vertical discharge, as well as other essential requirements of good unit ventilation, plus the following distinctive features:—

(1) Definitely eliminates cold drafts by syncretizing, through automatic means, the air-stream and room temperatures.

(2) Effects substantial savings in cost of installation by eliminating the direct radiator, with its unsightly exposed piping, traps and valves.

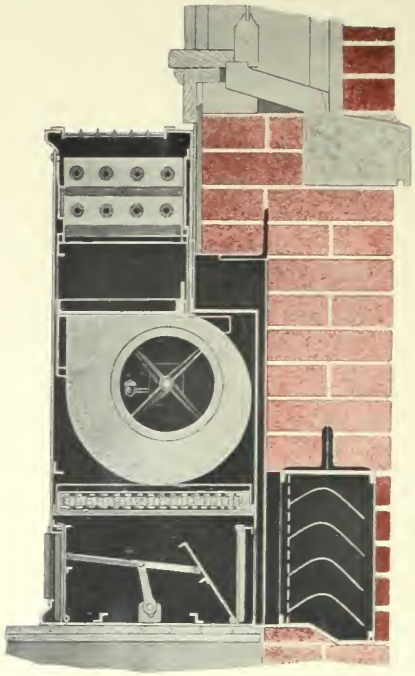
(3) Effects operating economies—
   (a) because overheating is definitely avoided;
   (b) because syncretizing control eliminates wide variations in air-stream temperature.

(4) Requires only 8 inches of aisle space, and is but 32 inches high.

(5) All connections, controls, etc., are completely enclosed within a beautiful casing having a baked-enamel finish.

THE following pages are devoted to types of units, specifications, tables of capacity, detail drawings and such other data as will enable the Architect and Engineer to select the proper Universal Duo-Luxe Unit. We invite your further inquiries.

UNIVERSAL DUO-LUXE UNITS



"DR"—RECESSED TYPE

Type DR

Type DR Universal Duo-Luxe Unit, recessed 6 inches into wall; projects into room only 8 inches. This unit, only 32 inches high, can be recessed under most window sills. Wall box should be at or near the finished floor line as shown.

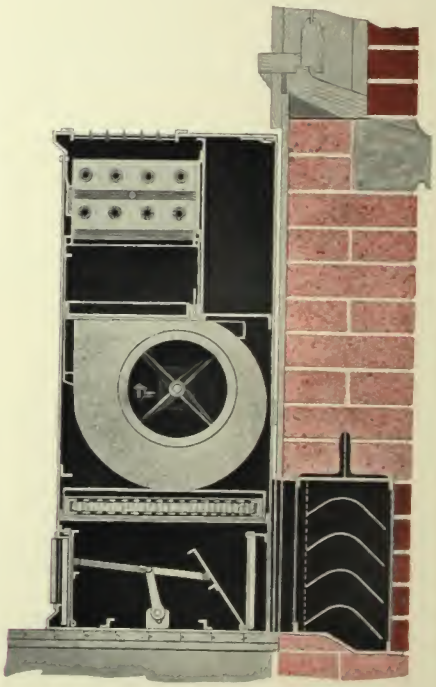
This is the most compact of all Heating and Ventilating Units.

Capacity Tables, Pages 19, 20, 21
Dimension Drawings, Page 22

Type DNR

Type DNR Universal Duo-Luxe Unit, non-recessed, projects into room 14 inches; only 32 inches high. This unit should be used where building construction will not permit the use of recessed type, but will permit wall box to be placed at or near the finished floor as shown.

Capacity Tables, Pages 19, 20, 21
Dimension Drawings, Page 23



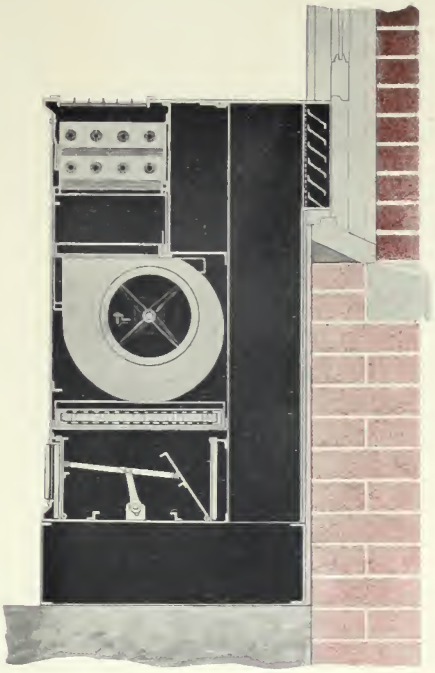
"DNR"—NON-RECESSED TYPE

are made in these various types . . .

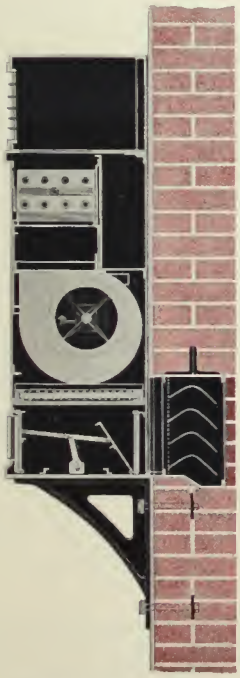
Type DW

Type DW Universal Duo-Luxe Unit, with false back for window-inlet connection. This unit is 19 inches wide, 32 inches high. A 5-inch deep false back is provided at back of unit so that air-inlet connection can be made over top of window sill, or a wall box may be used as shown in detail of **Type DFB** on Page 24.

Capacity Tables, Pages 19, 20, 21
Dimension Drawings, Page 25



"DW"—Window Inlet Type



"DH"—Wall Type

Type DH

Type DH Universal Duo-Luxe Unit is designed to fulfill the requirements of a horizontal-discharge unit where conditions necessitate a wall mounted unit.

Capacity Tables, Pages 19, 20, 21
Dimension Drawings, Page 26

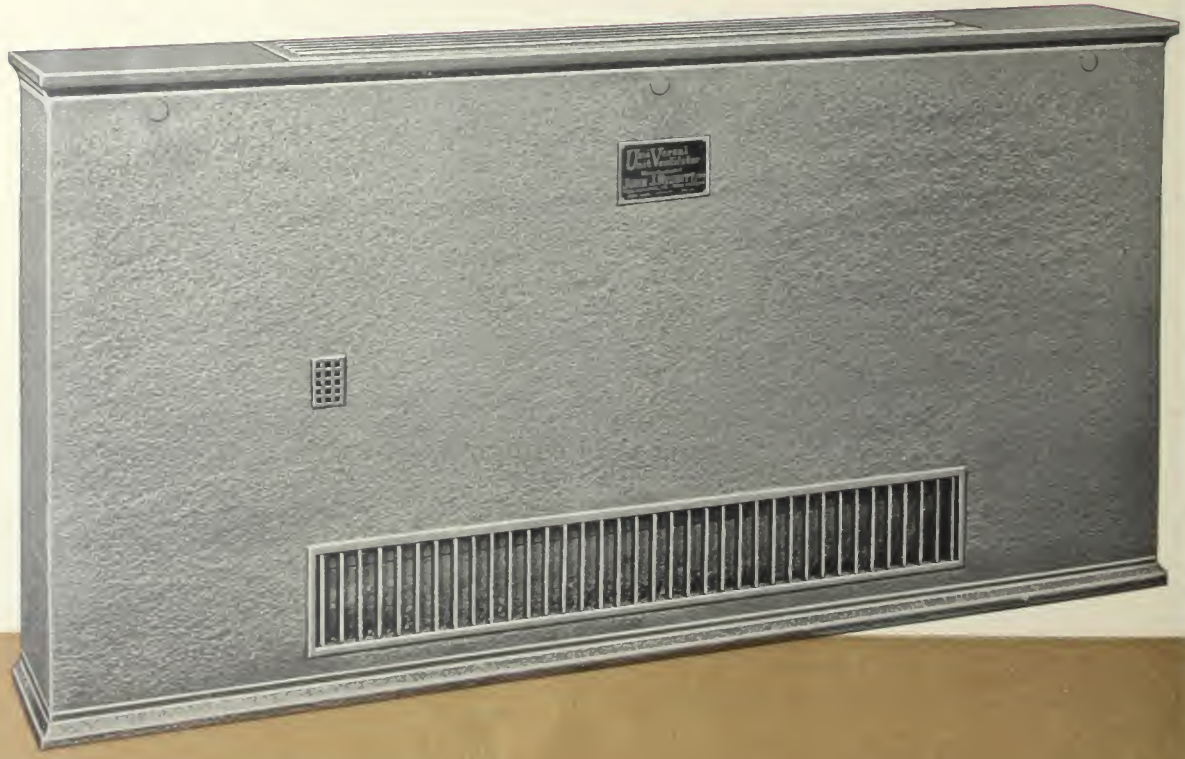
Type DE

A horizontal-discharge unit is also available in Type DE as shown on Page 27. The horizontal-discharge type of units should only be used where it is not possible to use the vertical type.

10 points of

★ *Syncretize*

to blend, combine
or reconcile
inharmonious elements



UNIVERSAL DUO-LUXE

superiority

1. High velocity, streamline outlet grille; vertical discharge of air with uniform movement over entire grille.

2. Upper radiator, with internal steam-distributing tubes, heats air from minimum to final temperature required to maintain desired room temperature.

3. Lower radiator, independent of upper radiator; heats air to specified minimum temperature. Internal steam-distributing tubes cause smallest quantity of steam to be evenly distributed over entire radiator.

4. Minimum air-stream stat syncretizes air-stream and room temperatures to a healthful, comfortable state, eliminating cold drafts.

5. Quiet-operating, low-speed motor, and fan assembly.

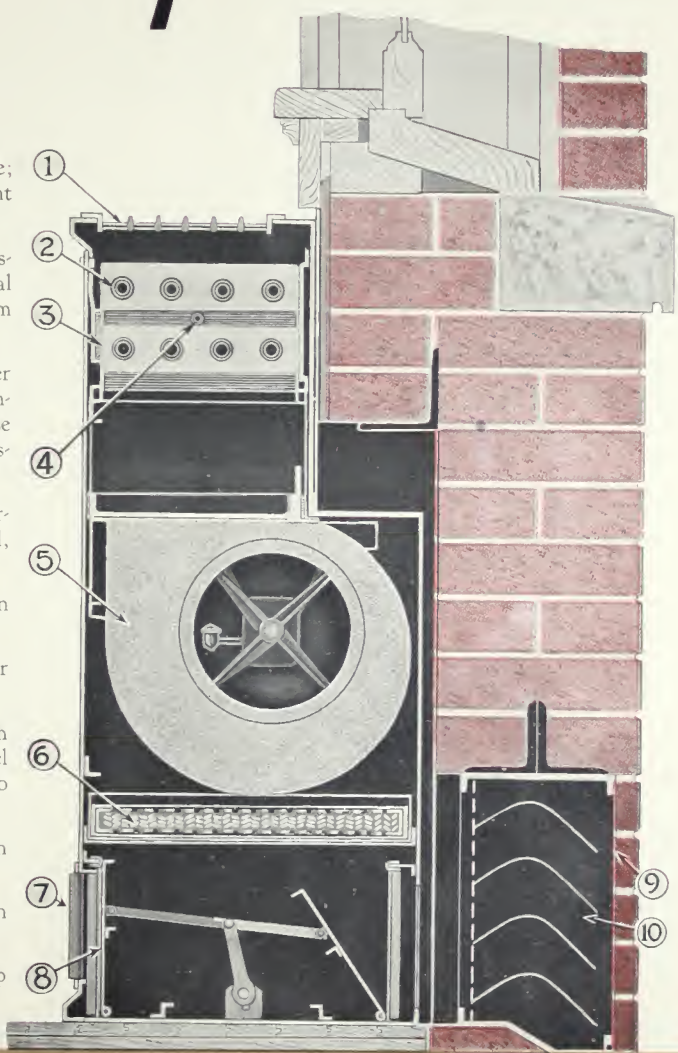
6. Air filter cleans outdoor and room air before it reaches motor and fan assembly.

7. Recirculating grille in conjunction with recirculating damper effects substantial fuel economy by shortening the period required to prepare room for occupancy.

8. Inlet and recirculating dampers, with efficient locking device.

9. Heavy bronze or aluminum inlet grille in a choice of modern designs.

10. Stationary storm-proof louvres in a deep galvanized iron wall box.



The Heating and Ventilating Unit
that delivers

Syncretized Air

Method of Rating

THE heating capacity of each **Universal Duo-Luxe Unit** is given in equivalent square feet of direct radiation (E. D. R.). This is computed on a basis of the average temperature rise over the full face of the discharge grille, and the amount of air delivered is measured by the anemometer at the final temperature.

The factors used for these computations are on the basis of the pounds of condensate per hour being equal to cubic feet per hour, multiplied by the temperature rise, specific heat and the weight of air at the final temperature, divided by the latent heat of evaporation. Tables are based on steam at 218 degrees Fahrenheit.

All air deliveries are based on heated air measured with a 4-inch anemometer used as prescribed in the Code of the A. S. H. V. E., with the instrument held 2 inches above the grille, and the volume being the product of the average velocity times gross area.

In each series, two different size radiators are available for each cabinet size.

In tables of capacities, the figures in red indicate the use of a high temperature radiator. The figures appearing in black indicate the use of a low temperature radiator.

Extreme care should be taken in the selection of the radiator, based upon the requirements of the particular room in which it is to be installed.

Generally, the high temperature radiator is used only where no direct radiation is provided in the classroom. The low temperature radiator is generally used in combination with direct radiation.

The tables of capacities apply to all Duo-Luxe units described in this publication.

It has been pointed out that all Duo-Luxe units are provided with three-speed motors; capacities are based upon 60-cycle motors operated at second speed, with air filters in place.

Duo-Luxe units are designed especially for use in classrooms. Their characteristics are such that the addition of duct work causes a reduction in the capacity of the unit. Duo-Luxe units should not be connected to duct work without the proper allowance for substantial reduction in air delivery.

In the tables of capacities the term "surplus heat," expressed in E. D. R., represents the difference between the total heating capacity of the Duo-Luxe Unit and the E. D. R. required to raise the temperature of the air to 70 degrees F.

In determining the amount of heating capacity required for a given room, the surplus heat can be deducted from the total requirements.

The E. D. R. required for heating air to 70 degrees F. for a given outlet temperature, as shown by the tables of capacities, is figured on the basis of the rated C. F. M. at final temperature; therefore the C. F. M. at 70 degrees F. will vary as the absolute final temperatures vary.

To convert equivalent direct radiation (E. D. R.) as shown to B. T. U., multiply by 240.

To obtain pounds of condensate, divide equivalent direct radiation (E. D. R.) by 4.

Tables of Capacities

100% Outside Air

450 C. F. M.—ALL TYPES

ONE MOTOR 400 R. P. M. TWO FANS 5" WIDE 7" DIAMETER. PERIPHERAL SPEED 733 FEET PER MINUTE

Inlet Temp. D.F.	−30°	−20°	−10°	0°	10°	20°	30°	40°	50°	60°	70°
Outlet Temp.	103°	108°	113°	120°	126°	131°	137°	143°	149°	155°	161°
D.F.	81°	86°	91°	98°	104°	109°	115°	121°	127°	133°	139°
Total Heat	253	241	230	222	212	201	193	183	175	166	157
E.D.R.	220	208	197	188	178	168	158	150	141	132	123
Heat for Air	191	171	150	131	110	91	72	54	35	18	0
to 70° in E.D.R.	200	177	157	132	114	95	75	56	37	18	0
Surplus Heat	62	70	80	91	102	111	121	129	140	148	157
E.D.R.	20	31	40	56	64	73	83	94	104	114	123

600 C. F. M.—ALL TYPES

ONE MOTOR 520 R. P. M. TWO FANS 5" WIDE 7" DIAMETER. PERIPHERAL SPEED 953 FEET PER MINUTE

Inlet Temp. D.F.	−30°	−20°	−10°	0°	10°	20°	30°	40°	50°	60°	70°
Outlet Temp.	98°	103°	108°	112°	118°	124°	130°	136°	142°	148°	152°
D.F.	73°	79°	84°	90°	96°	102°	108°	114°	120°	126°	132°
Total Heat	328	313	297	280	267	254	242	230	218	207	196
E.D.R.	277	262	247	234	221	208	197	185	173	161	149
Heat for Air	257	229	202	175	148	122	97	72	47	24	0
to 70° in E.D.R.	270	240	211	183	155	128	102	75	50	25	0
Surplus Heat	71	84	95	105	119	132	145	158	171	183	196
E.D.R.	7	22	36	51	66	80	95	110	123	136	149

750 C. F. M.—ALL TYPES

ONE MOTOR 650 R. P. M. TWO FANS 5" WIDE 7" DIAMETER. PERIPHERAL SPEED 1190 FEET PER MINUTE

Inlet Temp. D.F.	−30°	−20°	−10°	0°	10°	20°	30°	40°	50°	60°	70°
Outlet Temp.	92°	97°	102°	107°	114°	120°	126°	132°	138°	144°	150°
D.F.	70°	75°	80°	85°	92°	98°	104°	110°	116°	122°	128°
Total Heat	394	375	356	337	324	308	293	278	263	248	233
E.D.R.	337	318	298	279	266	250	234	219	205	191	177
Heat for Air	326	290	256	222	186	155	123	92	60	30	0
to 70° in E.D.R.	337	302	265	230	196	161	127	94	62	31	0
Surplus Heat	68	85	100	115	138	153	170	186	203	218	233
E.D.R.	0	16	33	49	70	89	107	125	143	160	177

1000 C. F. M.—ALL TYPES

ONE MOTOR 640 R. P. M. TWO FANS 6" WIDE 7" DIAMETER. PERIPHERAL SPEED 1175 FEET PER MINUTE

Inlet Temp. D.F.	−30°	−20°	−10°	0°	10°	20°	30°	40°	50°	60°	70°
Outlet Temp.	102°	107°	112°	119°	125°	131°	137°	143°	149°	155°	161°
D.F.	80°	85°	90°	97°	103°	109°	115°	121°	127°	133°	139°
Total Heat	560	534	509	491	468	448	428	406	388	368	348
E.D.R.	486	459	433	416	394	373	352	332	313	293	273
Heat for Air	425	381	334	289	246	204	161	119	79	39	0
to 70° in E.D.R.	445	396	350	302	256	210	167	124	82	41	0
Surplus Heat	135	153	175	202	223	244	267	287	309	329	348
E.D.R.	41	63	83	114	138	163	185	208	231	252	273

1260 C. F. M.—ALL TYPES

ONE MOTOR 720 R. P. M. TWO FANS 6" WIDE 7" DIAMETER PERIPHERAL SPEED 1320 FEET PER MINUTE

Inlet Temp. D.F.	−30°	−20°	−10°	0°	10°	20°	30°	40°	50°	60°	70°
Outlet Temp.	93°	98°	103°	109°	115°	120°	126°	132°	138°	144°	150°
D.F.	70°	76°	81°	87°	93°	98°	104°	110°	116°	122°	128°
Total Heat	668	634	602	575	548	518	491	466	442	417	382
E.D.R.	567	538	505	477	440	419	394	368	344	320	296
Heat for Air	546	485	427	372	315	260	207	153	101	50	0
to 70° in E.D.R.	567	517	453	386	328	271	214	159	105	52	0
Surplus Heat	122	149	175	203	233	258	284	313	341	367	382
E.D.R.	0	21	52	91	112	148	180	209	239	268	296

1560 C. F. M.—ALL TYPES

ONE MOTOR 700 R. P. M. FOUR FANS 5" WIDE 7" DIAMETER PERIPHERAL SPEED 1285 FEET PER MINUTE

Inlet Temp. D.F.	−30°	−20°	−10°	0°	10°	20°	30°	40°	50°	60°	70°
Outlet Temp.	90°	95°	100°	106°	112°	119°	125°	131°	137°	143°	149°
D.F.	68°	73°	78°	84°	90°	97°	103°	109°	115°	121°	127°
Total Heat	811	770	730	690	664	636	604	572	541	512	483
E.D.R.	691	649	609	574	540	514	482	451	420	390	360
Heat for Air	680	605	533	462	392	323	255	190	125	62	0
to 70° in E.D.R.	710	630	555	480	408	336	267	196	130	64	0
Surplus Heat	131	165	197	234	272	313	348	382	416	450	483
E.D.R.	−19	19	54	94	132	178	215	255	290	326	360

The term "surplus heat" expressed in E. D. R. represents the difference between the total heating capacity of the Unit and the E. D. R. required to raise the temperature of the air to 70 degrees.

E. D. R. required for heating air to 70 degrees is figured on the basis of rated C. F. M. at final temperature; therefore, the C. F. M. at 70 degrees will vary as the absolute final temperatures vary

Red figures indicate "high temperature" radiator, black, "low temperature" radiator

Tables of Capacities

Partial Recirculation—50% Outside Air—50% Room Air

450 C. F. M.—ALL TYPES

ONE MOTOR 400 R. P. M. TWO FANS 5" WIDE 7" DIAMETER. PERIPHERAL SPEED 733 FEET PER MINUTE

Inlet Temp. D.F.	−30°	−20°	−10°	0°	10°	20°	30°	40°	50°	60°	70°
Outlet Temp.	131°	134°	136°	138°	141°	145°	148°	151°	154°	157°	160°
D.F.	110°	112°	114°	118°	121°	124°	126°	129°	132°	136°	140°
Total Heat	205	199	193	188	184	179	175	170	164	161	158
E.D.R.	172	165	160	155	150	145	140	136	132	128	124
Heat for Air	95	85	75	65	55	45	36	27	17	9	0
to 70° in E.D.R.	100	88	78	65	57	47	37	28	18	9	0
Surplus Heat	110	114	118	123	129	134	139	143	147	152	158
E.D.R.	72	77	82	89	93	98	103	108	114	119	124

600 C. F. M.—ALL TYPES

ONE MOTOR 520 R. P. M. TWO FANS 5" WIDE 7" DIAMETER PERIPHERAL SPEED 953 FEET PER MINUTE.

Inlet Temp. D.F.	−30°	−20°	−10°	0°	10°	20°	30°	40°	50°	60°	70°
Outlet Temp.	125°	128°	130°	132°	135°	138°	141°	144°	147°	150°	153°
D.F.	102°	105°	107°	110°	114°	116°	119°	122°	125°	126°	131°
Total Heat	262	254	246	238	231	225	219	213	207	201	195
E.D.R.	213	205	198	191	185	178	173	167	161	155	149
Heat for Air	128	114	101	87	74	61	48	36	23	12	0
to 70° in E.D.R.	135	120	105	91	77	64	51	37	25	12	0
Surplus Heat	134	140	146	151	157	164	171	177	184	189	195
E.D.R.	78	85	93	100	108	114	122	130	136	143	149

750 C. F. M.—ALL TYPES

ONE MOTOR 650 R. P. M. TWO FANS 5" WIDE 7" DIAMETER PERIPHERAL SPEED 1190 FEET PER MINUTE

Inlet Temp. D.F.	−30°	−20°	−10°	0°	10°	20°	30°	40°	50°	60°	70°
Outlet Temp.	120°	122°	125°	127°	131°	134°	137°	140°	143°	146°	148°
D.F.	96°	98°	102°	104°	107°	110°	113°	115°	119°	122°	127°
Total Heat	313	304	294	285	277	270	263	255	248	240	232
E.D.R.	257	247	237	228	221	213	205	198	191	184	177
Heat for Air	163	145	128	111	93	77	61	46	30	15	0
to 70° in E.D.R.	168	151	132	115	98	80	63	47	31	15	0
Surplus Heat	150	159	166	174	184	193	202	209	218	225	232
E.D.R.	89	96	105	113	123	133	142	151	160	169	177

1000 C. F. M.—ALL TYPES

ONE MOTOR 640 R. P. M. TWO FANS 6" WIDE 7" DIAMETER. PERIPHERAL SPEED 1175 FEET PER MINUTE.

Inlet Temp. D.F.	−30°	−20°	−10°	0°	10°	20°	30°	40°	50°	60°	70°
Outlet Temp.	131°	133°	136°	139°	142°	145°	148°	151°	154°	157°	160°
D.F.	109°	111°	114°	117°	120°	123°	126°	129°	132°	135°	138°
Total Heat	454	441	428	419	408	398	388	377	368	358	348
E.D.R.	379	366	353	344	333	323	314	302	293	283	273
Heat for Air	212	190	167	144	123	102	80	59	39	19	0
to 70° in E.D.R.	222	198	175	151	128	105	83	62	41	20	0
Surplus Heat	242	251	251	275	285	296	308	318	329	339	348
E.D.R.	157	168	178	193	205	218	229	240	252	263	273

1260 C. F. M.—ALL TYPES

ONE MOTOR 720 R. P. M. TWO FANS 6" WIDE 7" DIAMETER. PERIPHERAL SPEED 1320 FEET PER MINUTE

Inlet Temp. D.F.	−30°	−20°	−10°	0°	10°	20°	30°	40°	50°	60°	70°
Outlet Temp.	118°	121°	123°	125°	127°	131°	135°	139°	142°	144°	146°
D.F.	99°	102°	105°	107°	110°	113°	116°	119°	122°	125°	128°
Total Heat	527	510	494	480	467	452	438	426	414	401	386
E.D.R.	431	417	400	386	368	357	345	332	320	308	296
Heat for Air	273	242	213	186	157	130	103	76	50	25	0
to 70° in E.D.R.	283	258	226	193	164	135	107	79	52	26	0
Surplus Heat	254	268	281	294	310	322	335	350	364	376	386
E.D.R.	148	159	174	193	204	222	238	253	268	282	295

1560 C. F. M.—ALL TYPES

ONE MOTOR 700 R. P. M. FOUR FANS 5" WIDE 7" DIAMETER. PERIPHERAL SPEED 1285 FEET PER MINUTE.

Inlet Temp. D.F.	−30°	−20°	−10°	0°	10°	20°	30°	40°	50°	60°	70°
Outlet Temp.	118°	121°	123°	126°	130°	134°	137°	140°	143°	145°	147°
D.F.	97°	99°	102°	105°	103°	111°	114°	117°	120°	123°	126°
Total Heat	647	626	605	589	578	559	543	527	512	497	482
E.D.R.	525	504	484	476	450	437	421	405	390	375	360
Heat for Air	340	302	255	231	195	151	123	95	62	31	0
to 70° in E.D.R.	355	315	277	240	204	168	133	98	65	32	0
Surplus Heat	307	324	340	358	382	398	415	432	450	466	482
E.D.R.	170	189	207	227	246	269	288	307	325	343	360

The total E. D. R. for any percentage of recirculation is equal to the E. D. R. in the 100% fresh air tables for a given inlet temperature, multiplied by the percentage of fresh air used and added to the E. D. R. shown in this same table at 70 degrees inlet, multiplied by the percentage of room air used.

The surplus E. D. R. for any percentage of recirculation is equal to the total, calculated as above, minus the E. D. R. for air, shown in the 100% fresh air tables, multiplied by the percentage of fresh air.

Tables of Capacities

Partial Recirculation—33⅓% Outside Air—66⅔% Room Air

450 C. F. M.—ALL TYPES

ONE MOTOR 400 R. P. M. TWO FANS 5" WIDE 7" DIAMETER.
PERIPHERAL SPEED 733 FEET PER MINUTE.

Inlet Temp. D.F.	−30°	−20°	−10°	0°	10°	20°	30°	40°	50°	60°	70°
Outlet Temp.	141°	143°	144°	147°	149°	150°	152°	154°	156°	158°	160°
D.F.	120°	122°	124°	126°	128°	130°	131°	133°	135°	137°	140°
Total Heat	191	187	183	181	177	173	171	168	165	162	158
E.D.R.	156	152	148	145	142	139	135	133	130	127	124
Heat for Air	64	57	50	44	37	30	24	18	12	6	0
to 70° in E.D.R.	67	59	52	44	38	32	25	19	13	6	0
Surplus Heat	127	130	133	137	140	143	147	150	153	156	158
E.D.R.	89	93	96	101	104	107	110	114	117	121	124

600 C. F. M.—ALL TYPES

ONE MOTOR 520 R. P. M. TWO FANS 5" WIDE 7" DIAMETER.
PERIPHERAL SPEED 953 FEET PER MINUTE.

Inlet Temp. D.F.	−30°	−20°	−10°	0°	10°	20°	30°	40°	50°	60°	70°
Outlet Temp.	134°	136°	138°	139°	141°	143°	145°	147°	149°	151°	153°
D.F.	111°	113°	115°	117°	119°	121°	123°	125°	127°	129°	131°
Total Heat	239	234	229	224	219	214	210	206	202	199	195
E.D.R.	192	186	181	177	173	169	166	161	157	154	149
Heat for Air	86	76	67	58	49	41	33	24	16	8	0
to 70° in E.D.R.	90	80	70	61	51	42	34	25	16	8	0
Surplus Heat	153	158	162	166	170	173	177	182	186	191	195
E.D.R.	102	106	111	116	122	127	132	136	141	146	149

750 C. F. M.—ALL TYPES

ONE MOTOR 650 R. P. M. TWO FANS 5" WIDE 7" DIAMETER.
PERIPHERAL SPEED 1190 FEET PER MINUTE.

Inlet Temp. D.F.	−30°	−20°	−10°	0°	10°	20°	30°	40°	50°	60°	70°
Outlet Temp.	129°	130°	132°	134°	136°	138°	140°	142°	144°	146°	148°
D.F.	108°	109°	111°	113°	115°	117°	119°	121°	123°	125°	127°
Total Heat	285	279	273	266	262	257	252	247	242	237	232
E.D.R.	230	224	217	211	207	201	196	191	186	182	177
Heat for Air	109	97	85	74	62	52	41	31	20	10	0
to 70° in E.D.R.	112	101	88	77	65	53	42	31	21	10	0
Surplus Heat	176	182	188	192	200	205	211	216	222	227	232
E.D.R.	118	123	129	134	142	148	154	160	165	172	177

1000 C. F. M.—ALL TYPES

ONE MOTOR 640 R. P. M. TWO FANS 6" WIDE 7" DIAMETER.
PERIPHERAL SPEED 1175 FEET PER MINUTE.

Inlet Temp. D.F.	−30°	−20°	−10°	0°	10°	20°	30°	40°	50°	60°	70°
Outlet Temp.	140°	142°	144°	146°	148°	150°	152°	154°	156°	158°	160°
D.F.	119°	120°	122°	124°	126°	128°	130°	132°	134°	136°	138°
Total Heat	419	410	402	396	388	381	375	367	361	354	348
E.D.R.	344	335	326	321	313	306	299	293	286	280	273
Heat for Air	142	127	111	96	82	68	53	39	26	13	0
to 70° in E.D.R.	148	132	116	101	85	70	56	41	27	14	0
Surplus Heat	277	283	291	300	306	313	322	328	335	341	348
E.D.R.	196	203	210	220	228	236	243	252	259	266	273

1260 C. F. M.—ALL TYPES

ONE MOTOR 720 R. P. M. TWO FANS 6" WIDE 7" DIAMETER.
PERIPHERAL SPEED 1320 FEET PER MINUTE.

Inlet Temp. D.F.	−30°	−20°	−10°	0°	10°	20°	30°	40°	50°	60°	70°
Outlet Temp.	128°	130°	132°	134°	136°	138°	140°	142°	143°	145°	146°
D.F.	109°	111°	112°	114°	116°	118°	120°	122°	124°	126°	128°
Total Heat	481	469	459	450	441	431	421	413	405	397	386
E.D.R.	386	376	365	356	344	336	328	320	312	303	296
Heat for Air	182	161	142	124	105	86	69	51	34	16	0
to 70° in E.D.R.	189	172	151	128	109	90	71	53	35	17	0
Surplus Heat	299	308	317	326	336	345	352	362	371	381	386
E.D.R.	197	204	214	228	235	246	257	267	277	286	296

1560 C. F. M.—ALL TYPES

ONE MOTOR 700 R. P. M. FOUR FANS 5" WIDE 7" DIAMETER.
PERIPHERAL SPEED 1285 FEET PER MINUTE.

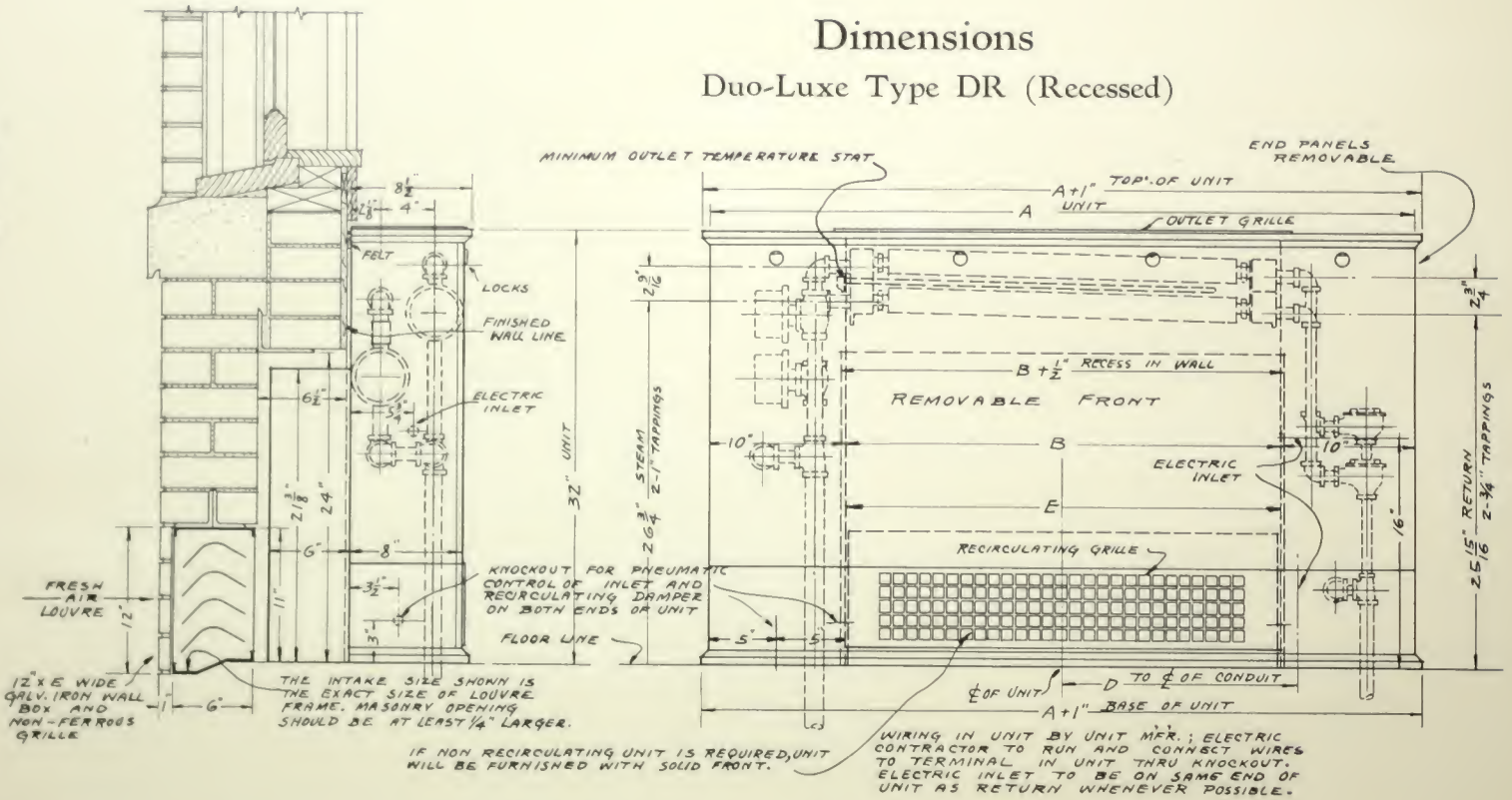
Inlet Temp. D.F.	−30°	−20°	−10°	0°	10°	20°	30°	40°	50°	60°	70°
Outlet Temp.	128°	129°	131°	133°	135°	137°	139°	141°	143°	145°	147°
D.F.	106°	108°	110°	112°	114°	116°	118°	120°	122°	124°	126°
Total Heat	591	577	564	553	542	533	522	513	501	493	482
E.D.R.	470	456	443	431	420	411	401	390	380	370	360
Heat for Air	226	201	177	154	131	107	85	63	41	21	0
to 70° in E.D.R.	253	210	185	160	136	112	89	65	43	21	0
Surplus Heat	365	376	387	399	411	426	437	450	460	472	482
E.D.R.	217	246	258	271	284	299	312	325	337	349	360

Please refer to page 18 for method of rating.

Variation in capacity of any Duo-Luxe Unit is obtained through speed control on motor.
Six different capacities are shown for three sizes of Duo-Luxe Units.

Dimensions

Duo-Luxe Type DR (Recessed)



Series Number	C. F. M.	A	B	D	E
54-DR	450—750	54″	34″	20″	30″
63-DR	751—1260	63″	43″	24½″	40″
72-DR	1261—1560	72″	52″	29″	50″

The series number 54-DR indicates a Recessed Type D (double radiator) Unit 54 inches long, with a range of capacity from 450 to 750 C. F. M.

The letters "DR" indicate a Recessed Unit with inlet arranged at or near the floor line, as shown above.

Radiators are both tapped 1-inch feeds, ¾-inch returns. Where smaller connections are made, eccentric bushings or reducers must be supplied by others.

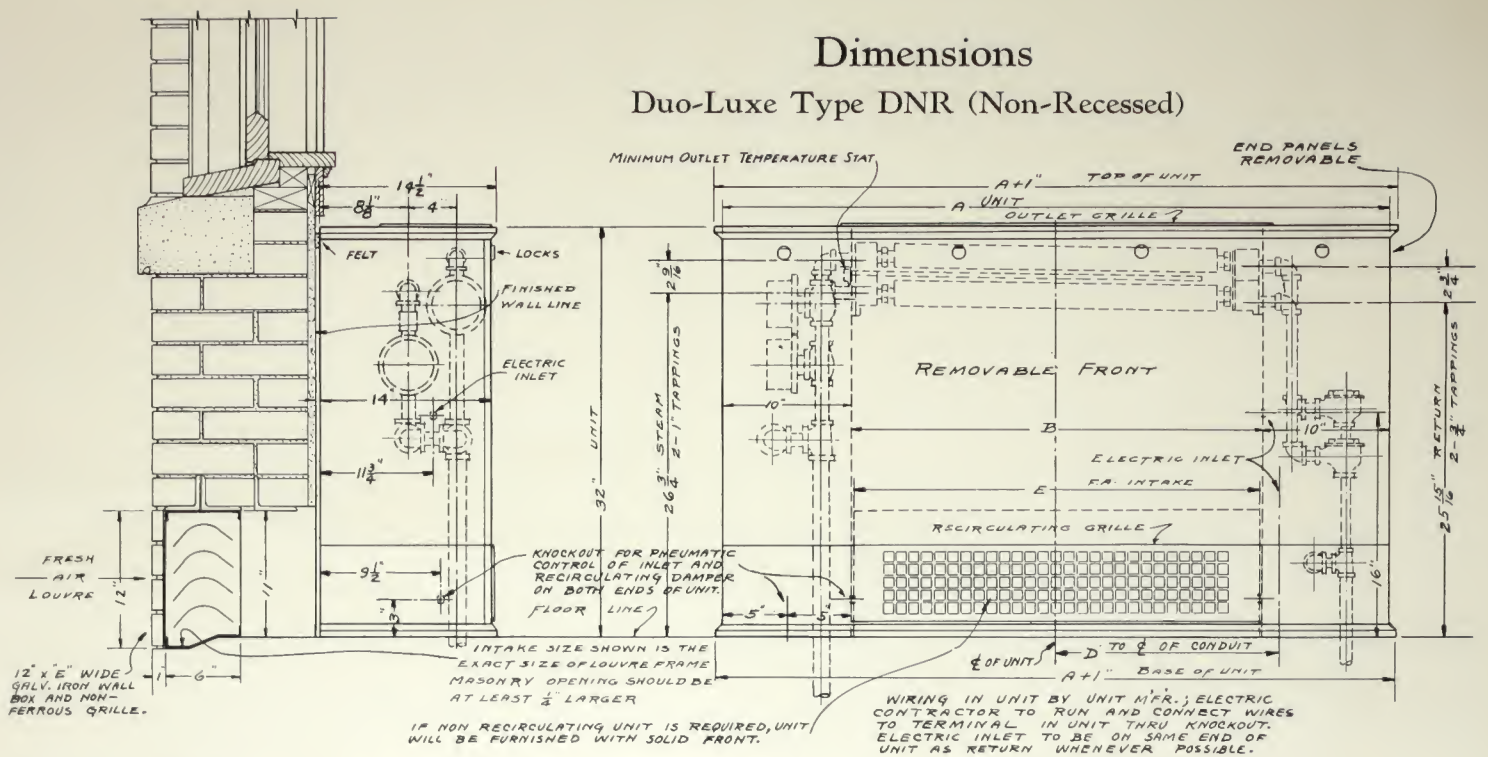
Fittings or piping of any kind are not supplied.

All Type D Units, up to and including 750 C. F. M. should be provided with two ¾-inch feed valves and two ½-inch return traps. Units of capacity above 750 C. F. M. should be provided with two 1-inch feed valves and two ½-inch return traps.

Feed and return connections are interchangeable and may be at either end of Unit, as best suits conditions at the building.

Dimensions

Duo-Luxe Type DNR (Non-Recessed)



Series Number	C.F.M.	A	B	D	E
54-DNR	450—750	54″	34″	20″	30″
63-DNR	751—1260	63″	43″	24½″	40″
72-DNR	1261—1560	72″	52″	29″	50″

Series number 63-DNR indicates a Type D (double radiator) Unit, 63 inches long, with a range of capacity from 761 C. F. M. to 1260 C. F. M.

The letters "D. N. R." indicate a Heatovent with inlet arrangement at or near the floor line, as shown above, non-recessed.

Radiators are both tapped 1-inch feeds, ¾-inch returns. Where smaller connections are made, eccentric bushings or reducers must be supplied by others.

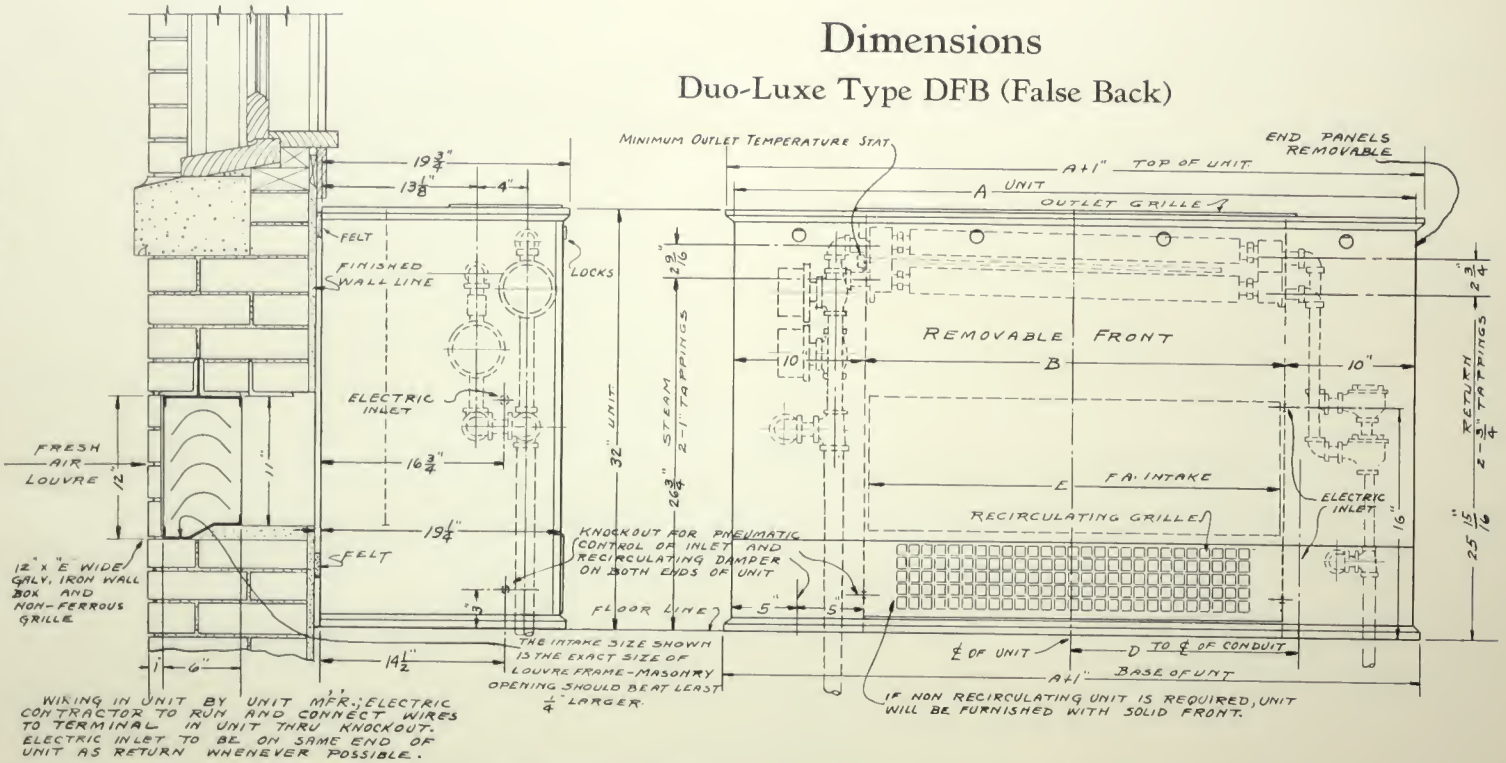
Fittings or piping of any kind are not supplied.

All Type D Units, up to and including 750 C. F. M. should be provided with two ¾-inch feed valves and two ½-inch return traps. Units of capacity above 750 C. F. M. should be provided with two 1-inch feed valves and two ½-inch return traps.

Feed and return connections are interchangeable and may be at either end of Unit, as best suits conditions at the building.

Dimensions

Duo-Luxe Type DFB (False Back)



Series Number	C. F. M.	A	B	D	E
54-DFB	450—750	54″	34″	20″	30″
63-DFB	751—1260	63″	43″	24½″	40″
72-DFB	1261—1560	72″	52″	29″	50″

Series number 72-DFB indicates a Type D (double radiator) Unit, 72 inches long, with a range in capacity of from 1261 C. F. M. to 1560 C. F. M.

The letters "F. B." indicate a false back Unit. This Unit has a 5-inch chamber at its back, which permits the wall box and grille to be located at any point between the top and the bottom of the Unit.

Radiators are both tapped 1-inch feeds, ¾-inch returns. Where smaller connections are made, eccentric bushings or reducers must be supplied by others.

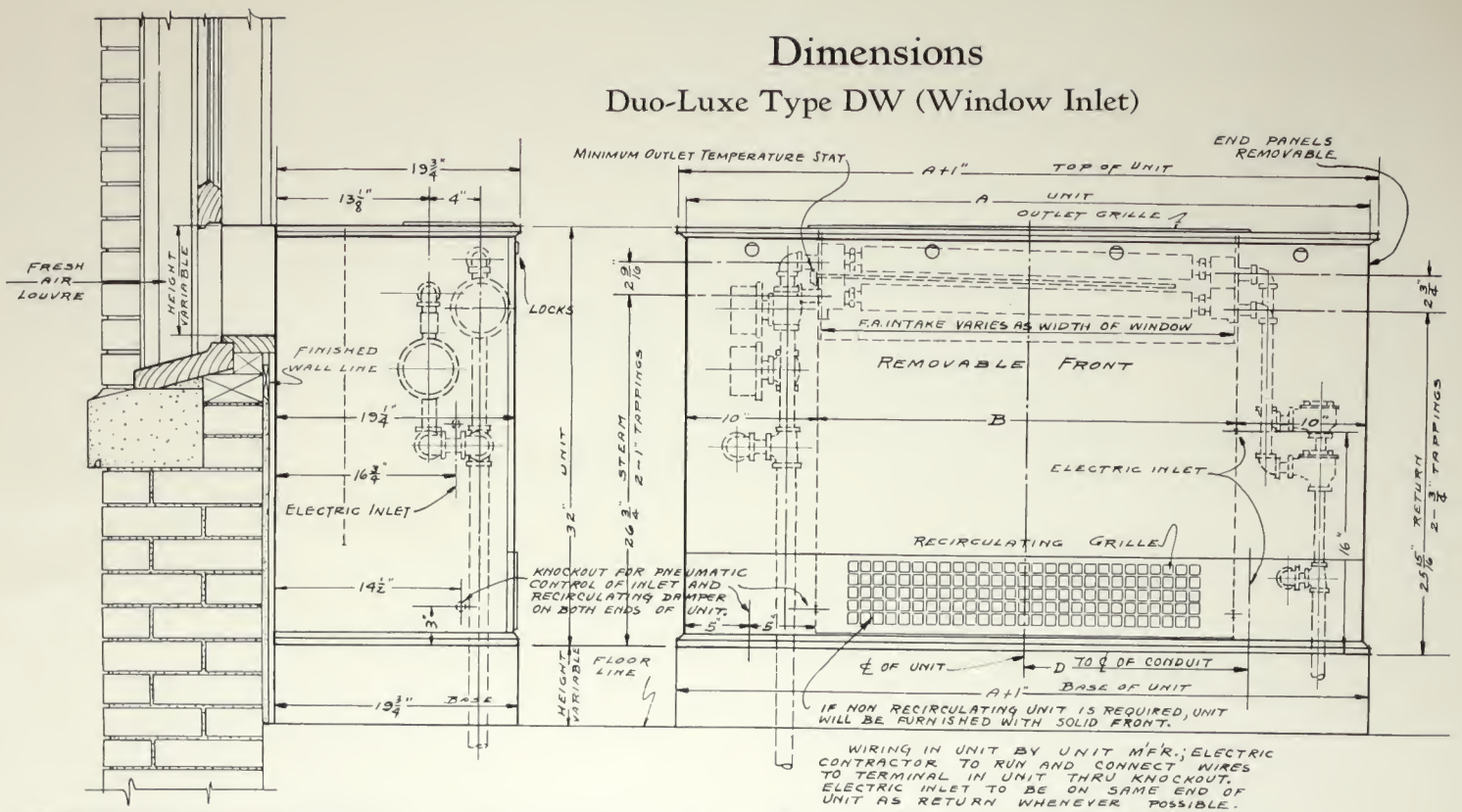
Fittings or piping of any kind are not supplied.

All Type D Units, up to and including 750 C. F. M., should be provided with two ¾-inch feed valves and two ½-inch return traps. Units of capacity above 750 C. F. M. should be provided with two 1-inch feed valves and two ½-inch return traps.

Feed and return connections are interchangeable and may be at either end of Unit, as best suits conditions at the building.

Dimensions

Duo-Luxe Type DW (Window Inlet)



Series Number	C. F. M.	A	B	D
54-DW	450—750	54″	34″	20″
63-DW	751—1260	63″	43″	24½″
72-DW	1261—1560	72″	52″	29″

Series number 54-DW indicates a Type D (double radiator) Unit 54 inches long, with a range in capacity of from 450 to 750 C. F. M.

The letter "W" indicates a window inlet arrangement.

The same information regarding tappings as given on Pages 22, 23, and 24 applies to this series unit.

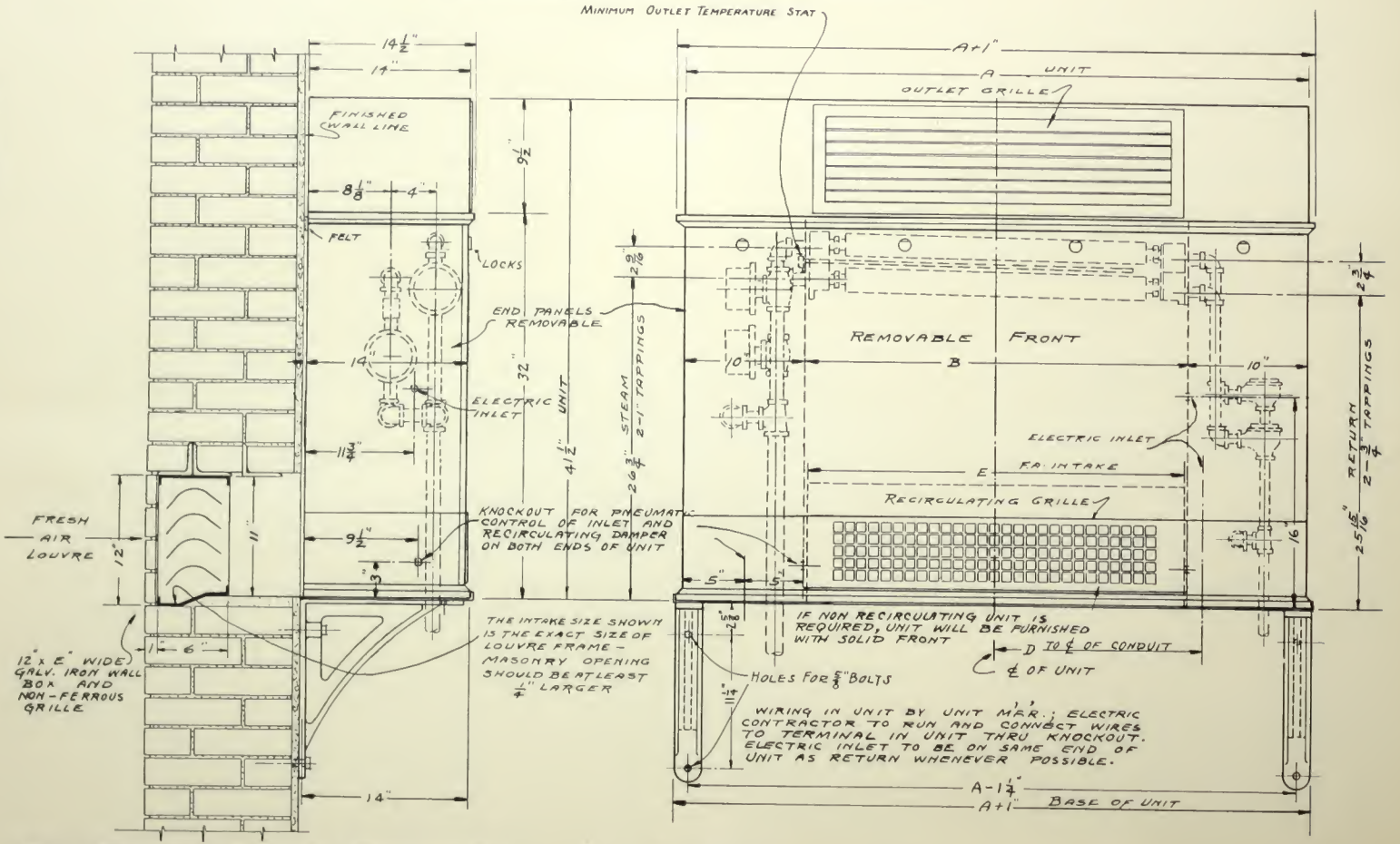
The fresh air inlet should be not less than 8 inches high.

The total net area of the inlet must be figured on a basis of a velocity of 600 feet per minute.

Where necessary to raise the Unit to compensate for difference in height of sill and bottom of inlet, a steel or wooden base should be specified.

Dimensions

Duo-Luxe Type DH (Wall Mounted)



Series Number	C. F. M.	A	B	D	E
54-DH	450—750	54″	34″	20″	30″
63-DH	751—1260	63″	43″	24½″	40″
72-DH	1261—1560	72″	52″	29″	50″

Series 72-DH indicates a Type D (double radiator) Unit, 72 inches long, with a range of capacity of from 1261 to 1560 C. F. M.

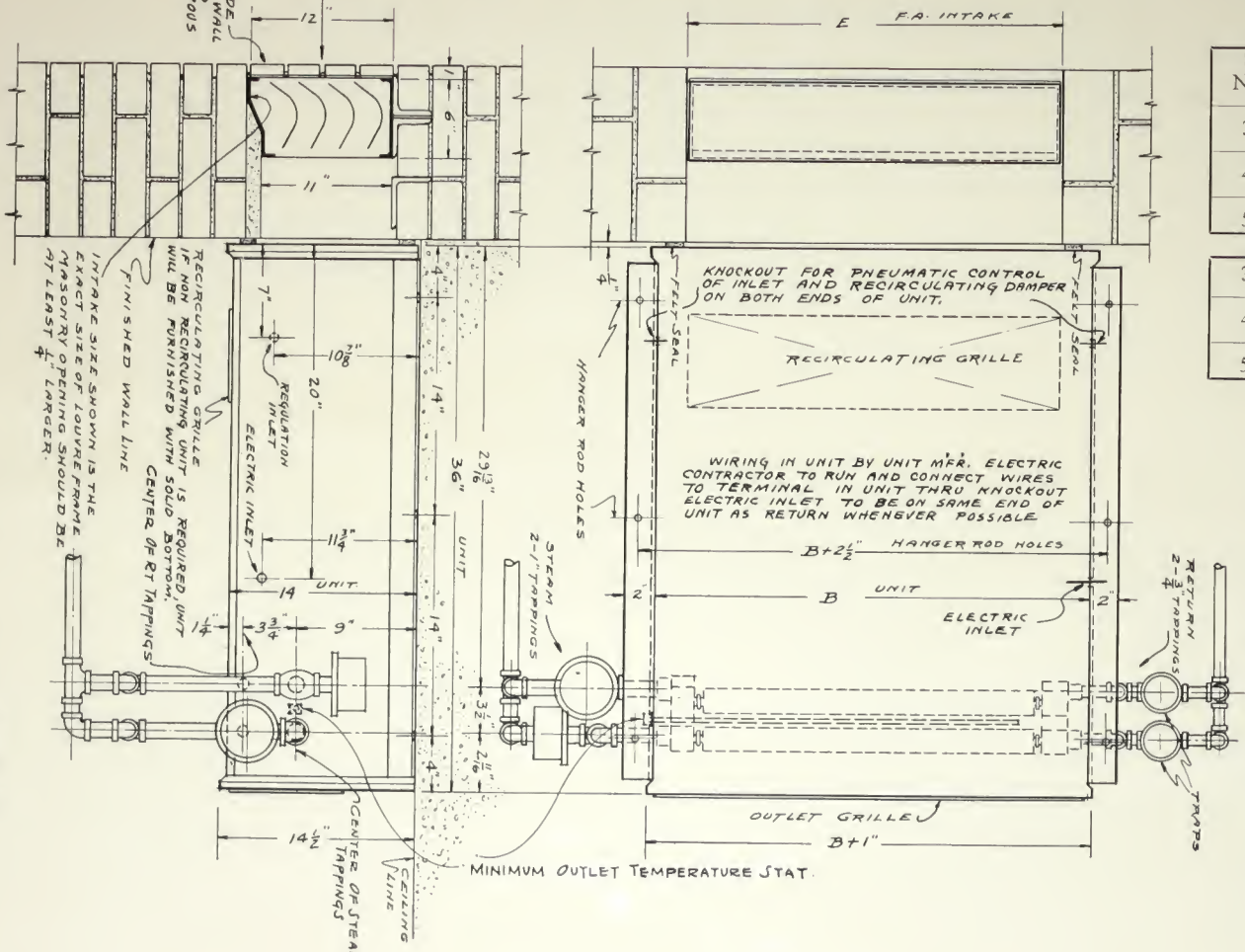
The letter "H" indicates a wall-mounted vertical unit having a horizontal discharge.

The information contained on Pages 22, 23, and 24 regarding tappings applies to this series unit.

Where ordered, brackets will be furnished with series "D. H." Unit, as shown above. Bolts or anchors of any kind for hanging this equipment are not furnished.

Dimensions

Duo-Luxe Type DE (Ceiling Type)



Series Number	B	E
34-DE	34″	30″
43-DE	43″	40″
52-DE	52″	50″

34-DE	450– 750 C. F. M
43-DE	751–1260 C. F. M.
52-DE	1261–1560 C. F. M.

The letter "E" indicates a horizontal ceiling-type unit.

The information contained on Pages 22, 23, and 24, regarding tappings applies to this series unit.

The carrying angles shown on the above drawing are furnished with this Unit.

Bolts or angles for the support of this unit are not furnished.

Specifications

Universal Duo-Luxe Units

1. Heating and ventilating contractor shall furnish and install complete and ready for use, Universal Duo-Luxe Heating and Ventilating Units as manufactured by John J. Nesbitt, Inc., Holmesburg, Philadelphia, Pa., and sold by the American Blower Corp., Detroit, Mich., of number, size and type shown on plans and specified herein.

2. Duo-Luxe Units shall be guaranteed to deliver the full volume of air shown on plans and specified herein, and to raise temperature of air from degrees F. to degrees F. with steam at two pounds pressure at radiators, for a continuous run of 72 hours, without undue noise or over-heating of motor.

3. Duo-Luxe fans shall be of the slow speed multiblade type, operating at a tip speed not greater than 1500 feet per minute when delivering their full rating against the resistance of the Unit.

4. Motor shall be designed to operate on phase, cycle, volt alternating current or direct current volts, and shall have ample power to drive fans continuously with a temperature rise not to exceed 40 degrees C.

5. The motors used on all Units shall be condenser-transformer, variable speed for single phase, alternating current; and transformer, variable speed for polyphase, alternating current; and series wound, variable speed for direct current. All alternating current motors shall be induction type, free of starting mechanism or other sliding electrical contact, and non-radio interfering.

6. The motor must be suspended from specially designed springs that dissipate any magnetic hum or vibration.

7. Bearings shall be phosphorus bronze, of liberal size, with wool-packed oiling system, which will permit 3000 hours of operation with one oiling.

8. Each motor must be provided with a three-speed control switch set to give speed variations of approximately 100 R. P. M. per stage.

9. Each Duo-Luxe Unit shall have an individual fuse block with fuses, entirely wired within the unit, wiring terminating at a block with binding post to which electrical contractor will make all electrical connections to Unit.

10. Radiators shall be constructed entirely of copper with no soldered, braized, or packed joints, and all prime surface shall be seamless drawn copper tubing provided with copper fins. Radiators shall be guaranteed to withstand freezing without bursting.

11. Each Duo-Luxe radiator shall be divided into a double heating unit, with a space of 1-inch between the upper and lower radiator. The feed header shall be constructed with a division between the upper and lower radiator so that one can be operated independently of the other. To permit freedom for expansion and contraction, the return headers shall be made in two separate units. Provisions must be made to accommodate minimum outlet temperature thermostat between the upper and lower radiator.

12. The tubes of the radiator shall be provided with internal steam-distributing tubes. The steam-distributing tubes shall be constructed of brass and shall be provided with a number of orifices located so as to cause uniform distribution of steam throughout the entire length of the radiator.

Use Either 13 or 13-A.

13. Recessed type D Duo-Luxe Units shall not project into the aisle of the room more than 9 inches and shall not be over 32 inches high.

13-A. Non-recessed type D Duo-Luxe Units shall not project into the aisle of the room more than 14 inches and shall not be over 32 inches high.

Use Either 14 or 14-A

14. Regulation contractor shall furnish to heating contractor at building two thermostatic supply valves to be installed on the supply connections to Unit radiators. The control contractor must supply and install a minimum outlet thermostat between the upper and lower radiator. This stat shall be set to maintain a minimum outlet temperature of 60 to 65 degrees F. as directed.

14-A. The steam supply to each of the two radiators in the Duo-Luxe Unit must be provided with self-contained automatic control valves. Each valve shall be provided with extended thermostat.

The thermostat on the upper radiator shall be located so that room air is circulated over the thermostat.

The extended thermostat controlling the valve on the lower radiator shall be located between the upper and lower radiator and shall be set to maintain an air stream temperature of 60-65 degrees F. by the lower radiator, as directed.

Use Either 15 or 15-A

15. Each Unit shall be provided with inlet and recirculating dampers supported on brass bearings. The dampers shall be provided with locking device and must be tight against outside air.

15-A. To provide for partial recirculation of air during period of occupancy, Duo-Luxe Units shall be equipped with a set of double dampers. One damper shall control the omission of outside air, the other room air, so that the operation of one will simultaneously open or close the other. A steel wall shall be provided between the fresh air and recirculating chamber to prevent outdoor air from entering room before passing through the radiators.

Each Unit shall be provided with a controlling mechanism and index so that any desired volume of air within the capacity of the unit can be obtained either from outdoors or from the room.

Use 16, 16-A, 16-B, or 16-C

16. Convenient means shall be provided for the manual operation of the inlet and recirculating damper. The operator must be provided with index showing the position of damper.

16-A. The inlet and recirculating damper of each Unit shall be pneumatically operated with damper motor provided by control contractor. This damper motor will be supplied to the unit manufacturer by the control contractor, but must be installed and connected to inlet damper by unit manufacturer.

16-B. The fresh air inlet damper of each Unit shall be provided with a self-contained electric heat motor and electrical thermostat with transformer for the automatic control of the inlet and recirculating dampers. Complete wiring connections to thermostat, transformer and heat motor must be provided within the unit casing by the unit manufacturer.

The electric thermostat shall be set so that when the temperature of the room air being circulated over the thermostat reaches 65 degrees F. the heat motor will open the fresh air inlet chamber and close the recirculation chamber. In the event of failure of the electric current, the heat motor must cause the inlet damper to close.

16-C. The fresh air inlet damper of each Unit shall be provided with a self-contained electric heat motor with transformer for the automatic control of the inlet and recirculating dampers.

The heat motor shall be connected in series with the fan motor. When fan motor is running, the heat motor will hold the inlet damper in an open position. When the fan motor is stopped, the heat motor will cause the inlet damper to close the fresh air opening.

Complete wiring connections to transformer and heat motor must be provided within the unit casing by the unit manufacturer.

Use Either 17 or 17-A

17. Duo-Luxe Units shall be recirculating type. A recirculating grille shall be provided at the front of each unit located approximately 1½ inch above the bottom of the unit casing.

17-A. Duo-Luxe Units shall be of the non-recirculating type.

18. Duo-Luxe cabinets shall be constructed of full finished furniture steel of not less than No. 14 gauge with olive green enamel baked on. Unit shall be provided with suitable locks on removable front, and extra keys shall be provided. All parts of cabinet shall be easily accessible for cleaning.

19. The casing shall be constructed to enclose all steam, electric and control equipment and connections thereto.

Use Either 20 or 20-A

20. The fresh air intake to each Duo-Luxe Unit shall be made through wall as shown on plans. Each Unit shall be provided with a No. 14 gauge galvanized iron storm louvre. The blades forming the louvre shall be of special shape, designed to offer a minimum resistance to the flow of air, and to keep water from entering the building. On face of each wall box provide a one-eighth inch thick bronze inlet grille, design number (*select design from page 31 and insert number*).

20-A. The fresh air intake to each Duo-Luxe Unit shall be made through window inlet connection as shown on plans. Each Unit shall be provided with a No. 16 gauge steel intake connection to fit window construction. Each window intake shall be provided with No. 16 gauge lattice design steel inlet grille. The inlet grille and connection thereto shall be finished to match the finish of Unit casing.

21. Masonry contractor will leave fresh air intake openings with lintels and set all wall boxes in place as the work progresses; but this contractor shall be responsible for proper size and location of all openings.

22. Plastering contractor will leave recess in plaster behind each recessed type Unit, recess to be strictly in accordance with details furnished by Unit manufacturer. Heating and ventilating contractor shall be responsible for the proper size and location of all recesses, as Unit rough-ing-in measurements should center with recesses. Units supported on walls shall be mounted on cast iron wall brackets furnished by unit manufacturer, but masonry contractor will set wall brackets in walls as directed by heating contractor.

Use 23 Only When Filters Are Desired

23. All Duo-Luxe Units shall be provided with air filters so placed as to be easily accessible and removable for cleaning. Filters shall be of adhesive type, and installation shall be complete, with necessary cleaning and oiling vats.

Insert for Electrical Specifications

24. Electrical contractor shall furnish and install a complete system of wiring to all of the Duo-Luxe Units shown on the plans, providing for each Unit a 150 watt (running current) outlet.

25. Electrical contractor shall make all electrical connections and do all wiring necessary for the operation of the ventilating units, fans, etc., furnished by heating contractor. See paragraph 9.

Insert for Masonry Specification

26. Masonry contractor shall provide fresh air openings through walls for the Heating and Ventilating Units, furnish lintels for same, and shall set the wall boxes in these openings. The wall boxes and detail drawings for their proper location shall be furnished by the heating and ventilating contractor.

Insert for Plastering Specification

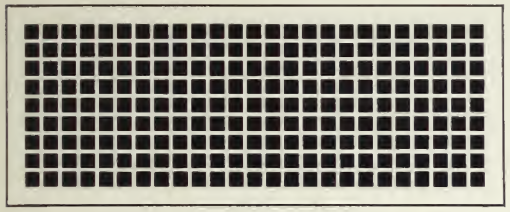
27. The plastering contractor shall leave recess in plaster behind each recessed type Heating and Ventilating Unit, recess to be in accordance with details furnished by Unit manufacturer. The heating and ventilating contractor will be responsible for the proper size and location of all recesses.

The UNIVERSAL Duo-Luxe Unit is designed to operate on a two pipe vacuum or vapor return line system with two thermostatic return traps on each unit.

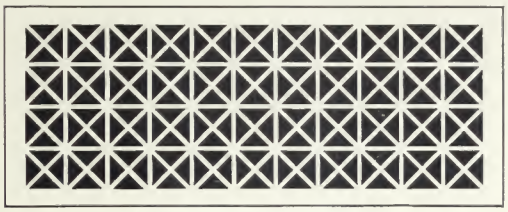
All heat sources should be controlled and exposed piping insulated to prevent overheating in mild weather.

Inlet Grilles

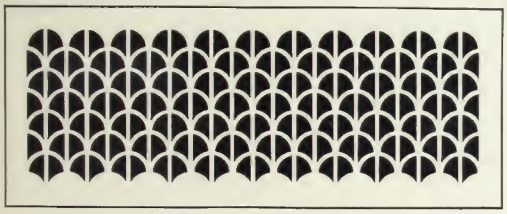
Now, the purchaser can choose any one of the four designs shown below for the inlet grille on the Universal Duo-Luxe Unit. These beautiful grilles, in either stamped aluminum or bronze, one-eighth inch thick, are furnished as standard equipment.



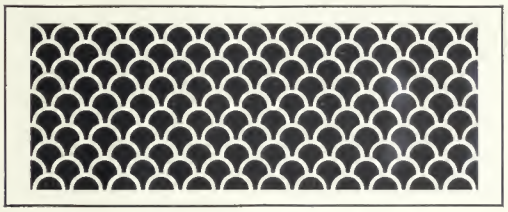
Plain Lattice—DESIGN NO. 1



Grecian—DESIGN NO. 2



Divided Shell—DESIGN NO. 3



Shell—DESIGN NO. 4

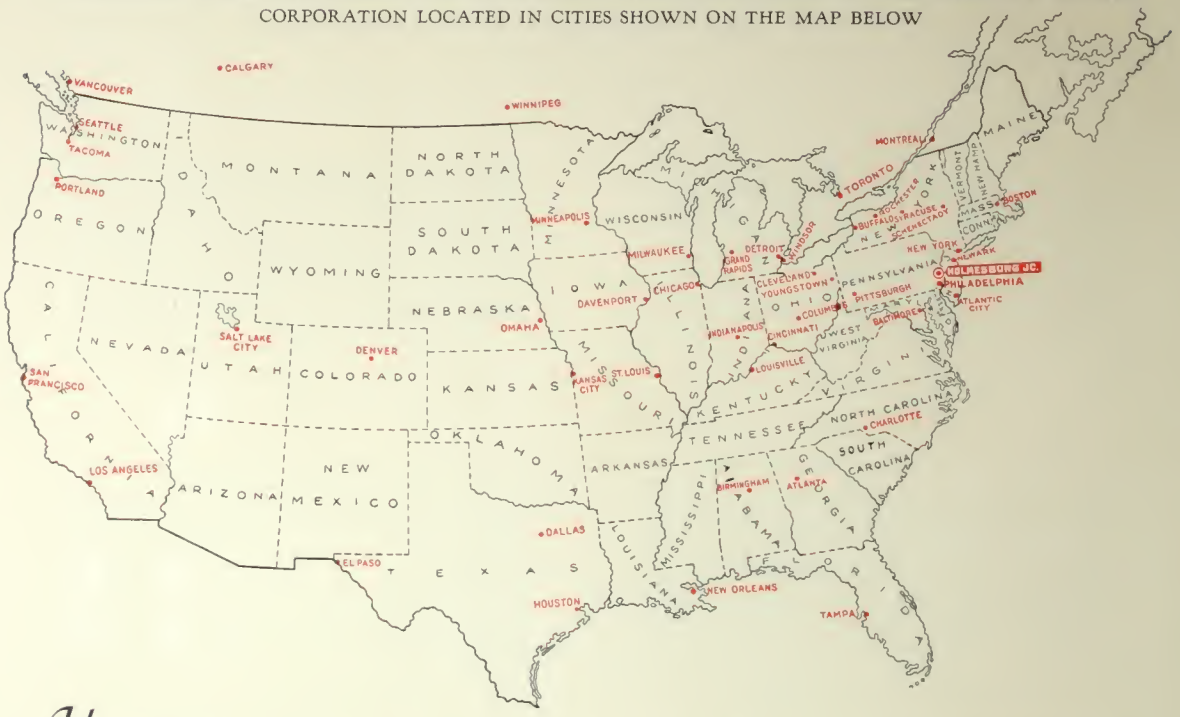
Caution

The results described herein can only be produced through the syncretization of air-stream and room temperatures through automatic means; therefore, Universal Duo-Luxe Units should only be specified where it is proposed to use automatic control of both air-stream and room temperatures.

Where it is intended to use manual control of the room temperature, we recommend the use of Universal By-pass Type Units. No by-pass type unit is capable of producing the same results as the Duo-Luxe Unit. The by-pass type unit does, however, lend itself more readily to manual control. Information on these units will be sent promptly upon request.

Nation-wide Sales and Service

"UNIVERSAL" SALES AND SERVICE ARE NATION-WIDE THROUGH OFFICES OF THE AMERICAN BLOWER CORPORATION LOCATED IN CITIES SHOWN ON THE MAP BELOW



UNIVERSAL Duo-Luxe Units are manufactured by John J. Nesbitt, Inc., and guaranteed to be free from mechanical defects in manufacture and operation. We will, after a season's use, accept the return and refund the full purchase price of any UNIVERSAL Unit that has failed to perform as represented herein.

JOHN J. NESBITT, INC.

Executive Office and Factory, HOLMESBURG, PHILADELPHIA, PA.
11 PARK PLACE, NEW YORK CITY

The home of UNIVERSAL Units

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UNIVERSAL TYPE D UNITS
A. I. A. FILE NUMBER 30-D-11
PRINTED IN U. S. A.

THE STANDARD BY WHICH
ALL OTHER MAKES ARE MEASURED

Syncretized Air


Syncretized Air